



## **EFFECTIVENESS OF PROBLEM BASED LEARNING MODELS BY USING E-LEARNING AND LEARNING MOTIVATION TOWARD STUDENTS LEARNING OUTCOMES ON SUBJECT CIRCULATION SYSTEMS**

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### **ABSTRACT**

The development of technology-based learning today is growing rapidly, the use of which combines the computer with the network is a growing up. One of them is e-Learning. By combining the use of e-Learning with Problem Based Learning model and motivation is expected to be effective in improving learning student's outcomes of circulatory material. Learning is not merely media or model, but motivation has an effect on learning. This research was conducted to measure the effect of PBL model applied with e-Learning and motivation to student outcomes. The method of research is Quasi Experiment with Two Way Anova Design. This study was conducted at SMPK St. Paulus Jakarta in May-June 2017. The data showed normal and homogeneous values ( $p > 0.05$ ) with a sample size of 30 people. Result of research using two way anova test got data that p value = 0.000, mean  $p < 0.05$  (reject  $H_0$ ). The conclusion is that (1) there is influence of PBL model by using e-Learning to student outcomes, (2) there is influence of motivation to student outcomes, and (3) there is interaction between PBL using e-Learning and motivation to student outcomes.

**Keywords:** e-Learning, motivation, problem based learning, student learning out comes

### **INTRODUCTION**

Technological advances make it easy for information seeking in education. The rapid development of science requires fast and easy technology in accessing information. One that develops in the world of education is learning by using e-Learning (Moore, Camilla, Krista, 2011). E-Learning is a tool that helps in learning so as to facilitate learners in the process of absorption of knowledge. The use of electronic devices such as laptops, computers, and gadgets makes it easy to access the latest information by using internet services (Suyanto, 2015). Delivery of information or knowledge from one person to another is easier and is not glued

by distance and time. Learning becomes more fun and easier (Moore, Camilla, and Krista, 2011).

If referring to the result of daily test of blood circulation system in human year 2015/2016 lesson, as much as 60% learners still not complete daily test value of circulation system in human, so needed appropriate strategy by using certain learning model to improve learners learn result. One of the suitable media in implementing e-Learning is PBL model (Problem Based Learning). The PBL model is a model that lifts a particular theme with its problems (Yolida, 2014). Learners are required to know the basic theory well in providing alternative solutions to problem solving on PBL model. Suitable problem

solving in Biology learning such as health and the environment. If you look at the problem, learners are expected to be able to identify the problem well and then provide a solution in problem solving (Dochy et al., 2003). The problem-solving model is excellent in achieving competence (Baden and Major, 2004).

The 2013 curriculum requires contextual learning with authentic assessment that the material described must be related to the reality of everyday life (Kunandar, 2015). Learning should relate the problems that exist in the classroom with the reality that is in the field. Therefore the PBL learning model fits into this material. Model that raised a problem in learning in the classroom, so that learners will be more interested (Dasna and Sutrisno, 2012).

Learning with PBL is particularly suitable in discussing the material in science, with PBLs increasing learners' self-confidence and can improve learning outcomes compared to traditional learning (Yew and Karen, 2016). One of the traditional models used today is STAD. STAD learning model (Student Team Achievement Divisions) is one part of the cooperative learning method that can grow the ability of cooperation, critical thinking and can help friends in understanding the subject matter together. But the STAD type has a weakness which is the learning process takes a relatively long time. So the time required to discuss less matter. Because the delivery of limited material can lead to low learning outcomes. (Puspitarini, 2015). The use of appropriate models and appropriate media will show good results, Problem Based Learning using web or e-Learning will show good results (Taradi, Radie, and Pokrajac, 2005). Learning with PBL will have a major impact by integrating with ICT (Information Communication Technologies), it can improve better learning outcomes (Osman, and Kaur, 2014).

Problem Based Learning model (PBL) using e-Learning will provide an innovative and fun learning. Sources of materials in

problem solving are not only sourced from books, but can be sourced from the internet that is integrated in the web and included in e-Learning (Wicaksono, Wing, and Andi, 2015). Learners can seek additional information from solving a problem that is not fixated on the book. Variations of case problems can be reproduced by sourced from e-Learning, compared to traditional learning models that teachers often do (Sindu, Santayasa, and Warpala, 2013). Traditional learning models such as STAD (Student Team Achievement Division) modelling on teamwork and learning with STAD model can create active, innovative, creative, and fun learning for learners during the learning process (Nikmah, 2015).

Learning is not only influenced by model or media only. Psychological level of learners also took over in its influence on learning. One of them is the level of motivation of learners, the motivation of learners is very influential on the level of cognitive ability of learners (Nikou and Anastasias, 2016). If motivation is high then it will get maximum learning result, and conversely low motivation will get minimum learning result. Low motivation can be observed from the tasks assigned by the teacher, not done by the learners, and the collection of tasks is not always appropriate with the time setted before. Motivation can also be enhanced by the use of attractive models and media. So that the attractiveness of learners increases, and learners are motivated to learn. Increased motivation will have an impact on learning outcomes (Harandi, 2015). Moreover, the low motivation will affect the low learning outcomes as well. This can be seen in one of the organ system's material system is the human circulatory system. The circulatory system that deals with blood, circulatory equipment, circulatory system large and small, blood type and abnormalities/diseases of the human circulatory system (Campbell, 2003).

Appropriate models used in learning and coupled with high levels of motivation from learners are expected to form an effective and enjoyable learning so that the

learning outcomes are also increasing. Therefore it is necessary to do research to analyze the influence of learning model on learning outcomes of learners. The title of this research is the influence of learning model PBL (Problem Based Learning) using e-Learning and the motivation of learners toward the learning outcomes of junior high school students.

The purpose of this research is to know the influence of PBL learning model by using e-Learning to learners' learning outcomes on human circulation system, the influence of learning motivation to learners' learning outcomes in human circulatory system, and PBL learning model interaction by using e-Learning and the level of motivation on the learning outcomes of junior high school students of the human circulatory system.

## METHOD

This study was conducted at St. Paul's Catholic Junior High School Jakarta. The time of research is in the even semester of the academic year 2016-2017. The affordable population in this study is all the students of class VIII in St. Paul's Catholic Junior High School Jakarta. The target population in this study is the entire class

Motivation (B)	Learning Model (A)	
	<i>Problem Based Learning with E-Learning (A1)</i>	STAD (A2)
High (B1)	A1B1	A2B1
Low (B2)	A1B2	A2B2

VIII. The sample in this research is the students of class VIII A and B. The method used in this research is **Quasi Experimental** method with 2x2 factorial research design.

## RESULT AND DISCUSSION

**Table 2.** Students' learning outcomes recapitulation in various classes

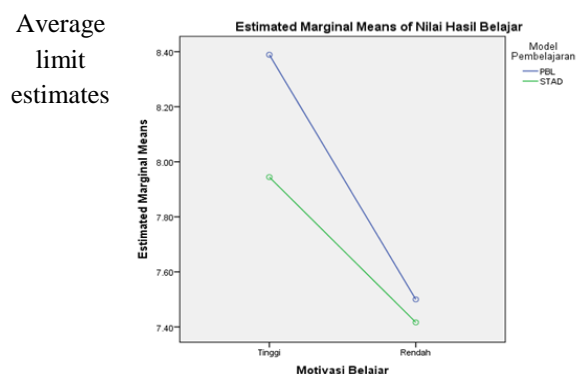
Learning Result Score Range	Students' Relative Frequency					
	A1	A2	A1B1	A1B2	A2B1	A2B2
55 - 64	12 %	19 %	-	30 %	-	60 %
65 - 74	15 %	31 %	-	50 %	-	35 %
75 - 84	16 %	23 %	-	20 %	40 %	5 %
85 - 94	30 %	12 %	40 %	-	60 %	-
95 - 104	22 %	12 %	60 %	-	-	-
105- 114	5%	3 %	-	-	-	-
Score Average (Mean)	86,88	67,66	97,60	70,67	82,77	50,44
Highest Score	111,05	104,60	113,55	105,82	89,90	75,77
Lowest Score	75	66,56	90,30	64,00	57,80	55,66

**Table 3.** Two way anova calculation's result

Variant Sources	F <sub>count</sub>	F <sub>table</sub>
Learning Models	11.206**	4,10
Motivation	46.324**	4,10
Interaction between PBL integrated learning model of E-learning and motivation	0.961*	4,10

Information : \*significant on  $\alpha = 5\%$

\*\* significant on  $\alpha = 1\%$



**Picture 1.** Interaction between learning model and learning motivation

Based on the results of the study, learning modeled Problem Based Learning. Learners are expected to have a greater enthusiasm, let the use of internet in a smartphone in learning, and it is not a new thing. Because students are usually allowed to use the smartphone in learning. Students with their anthologies seek answers from questions given by teachers in books and internet media. Learners present the search results and present the group with the presentation in front of the class.

Some learners during the presentation may add or buffer answers from their friends. Some new information for teachers are found by smartphone, because with the use of the internet learners can find new information that is also something new for a teacher, for example in learning there are learners who call cholesterol and form plaque on the wall and this is a type of cholesterol or lipoprotein difficult to dissolve in water or (LDL and VLDL). Probably learners do not understand exactly from the article but the discovery of this information should be well appreciated for the learners. Besides that, in learning the learners are also have greater enthusiasm and cooperative than using the models in usually use in Learning such as STAD.

The results of the hypothesis test calculation in table 2 found that the learning model affects the learning outcomes of learners in the material

circulatory system. Motivation affects the learning outcomes of learners on the material Circulatory System as well as there are interaction between learning models with motivation. These results indicate that the model of learning by using Problem Based Learning model is much better than the use of STAD. This is because Problem Based Learning is based on the problem, so that learners are more interested and feel that it or the problem exists in daily life or other words contextually. Another advantage is the use of e-Learning will increase the interest of students to learn and improve the interaction of learners with learning resources.

The results of this study are also supported by several previous researches: Research shown that the use of e-Learning increases the motivation of research from Sindu Year 2013. This research was to know Influence of e-Learning model based on the problem and motivation to learn on the learning outcomes of Vocational Highschool students. The result of this research was e-Learning could improve learning result. A similar research also has been done in 2005 from research journal by Taradi, SuncanaKukolja Year 2005. Blending Problem-Based Learning with Web technology positively impacted student learning outcomes in acid-basephysiology, but not measuring aspect of motivation. Research by using Problem Based Learning using e-Learning in the form of web can improve learning result in acid base material between control group and experiment.

Another Research on Problem Based Learning model using e-Learning, was conducted by Amelia in 2016. The model of Problem Based Learningwas applied to measure learning outcomes in the context of Competency Based Curriculum (KBK). As an addition, a research on motivation conducted by Fitriani Nugraheni with the title: The relationship of learning motivation to learners' learning outcomes

also showed good result. This study measure the relationship between motivation and learning outcomes. Research on Problem Based Learning using computer or ICT (Information Communication Technologies) has been done by Oman Year 2014. This study measure the effect of Problem Based Learning by using ICT to see the effect on learning outcomes.

Learning with ICT by usinge-Learning through certain Problem Based Learning model has been done, but specifically on the material circulation system has not been done. The results of this study shown that the application of Problem Based Learning model by using e-Learning can improve student learning outcomes on the human circulatory system.

Problem Based Learning model is one of the learning approaches that are considered to have scientific learning characteristics (Resti, Fauziah, 2013). In the learning with Problem Based Learning model, students ability optimized through group work, or team systematically, so that learners can empower, honest, and develop the ability. Therefore, the problem-based learning model is expected to improve the learning outcomes of learners because learners construct their own knowledge (Reigeluth in Rusmono, 2012). Problem Based Learning Model will increase students' self-confidence. In line with the above opinion, Natsir (2004) mentioned that Problem Based Learning is a model that can improve problem solving ability, thinking ability, and intellectual skills. Involves learners to act like adults and solve problems independently

Learning by using Problem Based Learning is suitable in discussing the scope of materials in science. Moreover, Problem Based Learning will increase students' self-confidence and can improve learning outcomes compared to traditional learning (Yew and Karen, 2016). One of the traditional models which is still used today is STAD.

STAD learning model (Student Team Achievement Divisions) is one way in cooperative learning method that can foster the ability of cooperation, critical thinking and can help each other in understanding the subject matter together. But the STAD type has a weakness which is the learning process takes a relatively long time. So the time required to discuss less matter. Because the delivery of limited material can lead to low learning outcomes. (Puspitarini, 2015). The use of appropriate models and appropriate media such as the use of Problem Based Learning by using web or e-Learning will show good results (Taradi, Radie, and Pokrajac, 2005). Learning with Problem Based Learning will have a major impact by integrating with ICT (Information Communication Technologies) to improve better learning outcomes (Osman, and Kaur, 2014).

Problem Based Learning model (PBL) using e-Learning will provide an innovative and fun learning. Sources of materials in problem solving are not only sourced from books, but can be sourced from the internet that is integrated in the web that is included in e-Learning (Wicaksono, Wing, and Andi, 2015). Learners can seek additional information from solving a problem that is not fixated on the book. Variations of case problems can be reproduced by sourced from e-Learning, compared to traditional learning models that teachers often do (Sindu, Santayasa, and Warpala, 2013). Traditional learning models such as STAD (Student Team Achievement Division) modeling on teamwork and learning with STAD model can create active, innovative, creative, and fun learning for learners during the learning process (Nikmah, 2015).

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In education, motivational issues have always been an interest. This is because motivation is seen as one of the most dominant factors in determining the achievement of educational goals (Nikou, 2016). From the statement Setyowati (2007), stated that learners who have high motivation will work harder than people who are lack of motivation or have low motivation. Learners who have the motivation to succeed should be given a challenging job. As a vice versa, the less motivated learners should be given a job that can roughly work with good results. If the motive or motivation to learn arise every time in the learning, it likely believed it can increase the learning outcomes (Nugraheni, 2013). Many talented learners do not develop because they do not have the motivation that suits their talents. If the learners have motivation in accordance with the talents they have, then the learning results to be obtained will be very high.

## CONCLUSION

Based on the results of the study, the use of integrated learning model of Problem Based Learning E-Learning has an effect on the learning result. In addition, motivation also has an influence on student learning outcomes. The existence of interaction of learning model Problem Based Learning integrated E-Learning and

motivation also have an effect on to result of student learning.

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